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STRATEGIC MANAGEMENT OF RESOURCES AND TECHNOLOGIES FOR A SMART AND GREEN SPACE CAMPUS

Abstract

The case study "Strategic management of resources and technologies for a Smart and Green Space Campus" focuses on the programmatic aspects and projects' outcomes related to the implementation of innovative green solutions for the infrastructure and energy management of an ESA establishment.

Space technology provides real-time information with a constantly evolving level of accuracy, which represents the key factor in the development of future cities and their surrounding environment. Making use of this data allows also the creation of value added services to the communities, ensuring an efficient and sustainable approach to their development.

The ESA Centre for Earth Observation, ESRIN, was selected as a test-bed for verifying the feasibility of this approach and to demonstrate the effectiveness of this strategy with respect to the working conditions of the establishment.

Therefore the strategic approach includes a survey of the local resources management, the evaluation of innovative green technologies and their possible implementation at ESRIN, the definition of the requirements for the new activities, the selection of the final technical configuration and its associated cost assessment, the deployment on site and the measurement of the expected improvements.

The aim is to use space technologies and services in order to facilitate the planning and evolution of ESRIN infrastructure. This includes the evaluation of the renewable energies potential of the site using high resolution Synthetic Aperture Radar data for the creation of a Digital Elevation Model, the testing of technologies from space spin-off companies in collaboration with the *ESA Technology Transfer Program Office* (e.g. fire extinguishing technology for Data Centres and power conversion systems for efficient water pumping from wells using renewable energy) including the identification of innovative technologies developed for the International Space Station, having a significant potential contribution to future human exploration endeavours, and lessons learnt from flight operations in the area of infrastructure planning, construction and predictive maintenance.

The impacts of the ESA establishment on its surrounding environment are being evaluated and proactively addressed through the reduction of light pollution, water cycle optimization, smart gardening, gas emissions reduction and green sustainable mobility.

This holistic approach provides a vision towards a respectful lifestyle of the people on campus, limiting their impact on soil, air and water and thereby demonstrating the value of Space technologies in the creation of Smart Cities.